Amendment to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended) A system for detecting a component of interest in a sample, the system comprising:

(i) a microfluidic device comprising:

(a) a first microscale channel comprising a gel filled component separation region;

(b) a second microscale channel downstream from the first channel that is fluidly coupled to the first channel, the second channel configured to contain a particle set therein;

(c) a binding region fluidly coupled to or within the first channel;

(d) a source of a component-binding moiety fluidly coupled to the binding region which is capable of binding to the component of interest;

(e) a first detection region within the first channel; and

(f) a second detection region within the second channel which includes a particle stacking region within the second detection region;

(ii) a fluid direction system fluidly coupled to the microfluidic device, which fluid direction system is configured to transport the sample through at least the first and second microscale channels;

(iii) a control system operably linked to the fluid direction system, which control system is configured to instruct the fluid direction system to deliver or transport the sample through at least the first and second microscale channels; and

(iv) a detection system which is configured to be positioned proximal to the first and second detection regions.

2. (original) The system of claim 1, wherein the control system comprises a computer and software, which software analyzes signals produced from detection at the first and second detection regions.

3. (original) The system of claim 2, wherein the computer includes software which is programmed to direct fluid movement in the system.

4. (original) The system of claim 3, wherein the software directs one or more of:

movement of the sample through the component separation region of the first channel, resulting in separated components;

movement of a particle set and the separated components to the binding region, resulting in binding of the separated components to the particle set;

movement of the component-binding moiety to the binding region, resulting in binding of the component-binding moiety to the component of interest; and,

movement of the particle set, separated components, and the component-binding moiety to the particle stacking region in the second detection region, where the component-binding moiety is detected, thereby detecting the component of interest.

5. (original) The system of claim 4, wherein the software further directs movement of one or more of a buffer solution and a blocking solution through the binding region.

6. (original) The system of claim 4, wherein the software directs movement of the particle set from a source of the particle set to the particle stacking region.

7. (original) The system of claim 4, wherein the software directs a washing solution to flow through the binding region.

8. (original) The system of claim 1, wherein the component of interest is a protein and the component binding moiety is a protein-binding moiety.

9. (original) The system of claim 1, wherein the component-binding moiety is an antibody.

10. (original) The system of claim 1, wherein the component of interest is a carbohydrate and the component binding moiety is a carbohydrate-binding moiety.

11. (original) The system of claim 10, wherein the carbohydrate-binding moiety is a lectin specific to the carbohydrate.

12. (original) The system of claim 1, wherein the component-binding moiety is a lectin.

13. (original) The system of claim 1, wherein the component-binding moiety is avidin or biotin.

14. (original) The system of claim 1, wherein the component of interest comprises avidin and the component-binding moiety is biotin.

15. (original) The system of claim 1, wherein the component of interest comprises biotin and the component-binding moiety is avidin.

16. (original) The system of claim 1, wherein the fluid direction system is an electrokinetic based fluid direction system.

17. (original) The system of claim 1, wherein the fluid direction system is a pressure based fluid direction system.

18. (original) The system of claim 1, wherein the component separation region is a polyacrylamide gel filled region.

19. (original) The system of claim 1, further comprising a source of a particle set fluidly coupled to the second microscale channel, the particle set comprising particles made from a polymeric material, a silica material, a ceramic material, a glass material, a magnetic material, a metallic material, or an organic material.

20. (original) The system of claim 1, further comprising a source of a particle set fluidly coupled to the second microscale channel, the particle set comprising particles made from PVDF, polyamide, nylon, or nitrocellulose.

21. (original) The system of claim 1, wherein the particle stacking region comprises a barrier on which a particle set may be fixed.

22. (original) The system of claim 1, wherein the detection system comprises a chemiluminescent, fluorescent, or colorimetric detector.

23. (original) The system of claim 1, wherein the binding region is located within a third channel that intersects and fluidly connects the first and second channels.